

Date: Monday, 18/08/2008 3:39:31 PM
 *User: Julie Lecocq

Process Sheet

Customer :	CU-DAR001 Dart Helicopters Services	Drawing Name :	BO 105 SKIDTUBE ASSEMBLY
Job Number :	41331		
Estimate Number :	10119		
P.O. Number :		Part Number :	D105674011
This Issue :	18/08/2008	S.O. No. :	
Prsht Rev. :	NC	Drawing Number :	D2966 REV A2
First Issue :	/ /	Project Number :	N/A
Previous Run :	41330	Drawing Revision :	A2
	Type :	Material :	
	SKIDTUBES	Due Date :	15/09/2008
Written By :		Qty:	1
Checked & Approved By :	JLD 08.8.18	Um:	Each
Comment :	Est Rev:A 04.07.07 New Issue KJ/JLM		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	DC	DOCUMENT CONTROL
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JLD 08.9.16

**Comment:** DOCUMENT CONTROL

Photocopy bluefile & type labels per PPP d105-674-0116 CHG002

2.0	D2962125	Outer Tube Extrusion
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**Comment:** Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number Description Batch

1 D2962-125 Extrusion 17532

IT 08.08.26

3.0	SKIDTUBES 1	SKIDTUBESS RESOURCE 1
-----	-------------	-----------------------

**Comment:** LANDING GEAR RESOURCE 1

1-Determine square end of tube and deburr

2-Drill #30 pilot holes using DT8678. Open holes to Ø5/16" (0.313"). Deburr holes.

IT 08.08.26

4.0	BENDING	BENDING MACHINE - SKIDTUBES
-----	---------	-----------------------------

**Comment:** BENDING MACHINE

Bend tube as per program BO105 on CNC Bender and Dwg D2966. Use 5/16" locator pin on buggy "A".

IT 08.08.27

5.0	SKIDTUBES 1	SKIDTUBESS RESOURCE 1
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**Comment:** LANDING GEAR RESOURCE 1

1-Cut Fwd end of the tube using DT8185-1G

IT 08.08.27

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 18/08/2008 3:39:32 PM
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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: BO 105 SKIDTUBE ASSEMBLY

Job Number: 41331

Part Number: D105674011

Black

Job Number:



Seq. #:

Machine Or Operation:

Description :

- 2-Cut Aft end at 107.06" using DT8185D
- 3-Deburr ends
- 4-Drill Aft Cap holes using DT8678
- 5-Locate DT8679 with 1/8 clecos in Aft Cap holes. Ensure DT8679 is centered on Fwd end of tube and drill #40 Fwd bushing.
- 6-Clamp DT8679 to the tube. Drill all #30 wearplate and crossbolt holes.
- 7-Open Aft Cap holes using #6 drill
- 8-Open wearplate holes and two side holes to Ø19/64" (0.297") as per Dwg D2966-1.
- 9-Deburr holes.
- 10-Open remaining (16) crossbolt holes to Ø0.500

08-08-28

6.0

D2964

Cap



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D2964

Cap

14106

A/R

Aluminum Rod

m/08708/m/07877

BE 08/08/28

7.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Weld Fwd Cap as per Dwg D2966 and QSI 004. Fill #40 Fwd cleco hole.

BE 08/08/28

2-Grind Fwd Cap welds flush

JD 8-8-29

8.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

~~08/08/28~~
Sodorlor

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Job Number: 41331

Part Number: D105674011

Job Number:



Seq. #:

Machine Or Operation:

Description :

9.0

QC10

VISUAL INSPECTION OF GROUND WELDS



Comment: VISUAL INSPECTION OF GROUND WELDS

Soelou/02
[Signature]

10.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

ET 08-09-02

11.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

Q H 8-9-2

12.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Open crossbolt holes to finish size as per Dwg D2966

2-Open 14 holes to Ø0.750" & 2 holes to Ø0.875", countersink crossbolt holes & remove alodine to prepare for welding as per Dwg D2966

3-Deburr holes inside & outside, blow out chips

ET 08-09-02

13.0

D2976

BO 105 Skidtube I Beam



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Numbe

Description Batch

1 D2976 Web

B-41668

AW-M
8-9-2

(12)

14.0

D2971

Cross Bolt Spacer



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D2971 Crossbolt Spacer

239011 BE 8-9-3

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Drawing Name: BO 105 SKIDTUBE ASSEMBLY

Job Number: 41331

Part Number: D105674011

Job Number:



Seq. #:

Machine Or Operation:

Description :

15.0

D2973

Cross Bolt Spacer



Comment: Qty.: 7.0000 Each(s)/Unit Total: 7.0000 Each(s)

Pick:

Qty Part Number Description Batch

7 D2973 Crossbolt Spacer

B14636

BE 8-9-3

16.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Bond Web in place per QSI 015. (Ensure holes line up)

Pick:

Qty Part Number Description Batch

A/R Sikaflex-291

Sikaflex expiry date:

M108801
8-10-1

AWM
- 8-9-2

2-Weld Crossbolt Spacers as per Dwg D2966 and QSI 004. For crossbolt spacer, weld one side, pass 5/8" drill; weld other side, pass 5/8" drill.

Pick:

Qty Part Number Description Batch

A/R Aluminum Rod

M108708 *BE 8-9-3*

3-Pass Ø0.630" drill to remove spillover for D2973 crossbolt. Pass Ø0.750" drill to remove spillover for D2971 crossbolt.

BE 8-9-3

4-Grind welds flush as per Dwg D2966

JO 8-9-4

17.0

QC10

VISUAL INSPECTION OF GROUND WELDS



Comment: VISUAL INSPECTION OF GROUND WELDS

5 *08/08/05* *(4)*

18.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

5 *08/08/05* *(7)*

19.0

POWDER COATING

POWDER COATING



Comment: HAND FINISHING RESOURCE #1

Powder Coat Black Sandtex (Ref: 4.3.5.7) as per QSI 005 4.3

START TIME:

9:15am

91

08-08-15 *(1)*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Job Number: 41331

Part Number: D105674011

Job Number:



Seq. #:

Machine Or Operation:

Description :

OVEN TEMPERATURE: 320 °C

FINISH TIME: 9:45 AM

JH 08-09-15 X1

20.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

FL 08/09/15 (1)

21.0

D2965

Cap, 105 Skidtube



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D2965

Cap

B42009

FL

22.0

D29701

Wearplate



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D2970-1

Wearplate

B33220

FL

23.0

D29703

Wearplate



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D2970-3

Wearplate

B14590

FL

24.0

D31761

Bushing



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D3176-1

Bushing

B33222

FL

25.0

D31763

Nut



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick:

Qty Part Number

Description Batch

1 D3176-3

Nut

B37585

FL 08/09/15 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

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Drawing Name: BO 105 SKIDTUBE ASSEMBLY

Job Number: 41331

Part Number: D105674011

Job Number:



Seq. #:

Machine Or Operation:

Description :

26.0

ALS71032130

Insert



Comment: Qty.: 36.0000 Each(s)/Unit Total : 36.0000 Each(s)

Pick:

Qty Part Number Description Batch

36 ALS7-1032-130 Insert m105819

or ALS4-1032-130

or AKS7-1032-130

or AKS4-1032-130

F2

27.0

AN960JD10L

Washer



Comment: Qty.: 28.0000 Each(s)/Unit Total : 28.0000 Each(s)

Pick:

Qty Part Number Description Batch

30 ~~28~~ AN960JD10L Washer m105793

F2

28.0

MS27039108

Screw



Comment: Qty.: 26.0000 Each(s)/Unit Total : 26.0000 Each(s)

Pick:

Qty Part Number Description Batch

Q8 ~~26~~ MS27039-1-08 Screw m109061

F2

29.0

MS27039109

Screw



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part Number Description Batch

~~2~~ MS27039-1-09 Screw m18057

F2

30.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

1-Inspect for foreign objects as per QSI 024

2-Install Inserts, Wearplate and Cap per Dwg D2966. Insert a drop of sikaflex at insert holes before installing wearplates. Seal Aft Cap using Sikaflex. Install bushing and nut. By looking Fwd, install nut to right hand side.

Pick:

F2 08/09/12 @

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Job Number: 41331

Part Number: D105674011

Job Number:



Seq. #:

Machine Or Operation:

Description :

Qty Part Number Description Batch

A/R Sikaflex-291 M108443

Sikaflex expiry date: 08/11

> F2 08/09/12 @

3-Wing Walk as per Dwg D2966 and QSI 005 4.4

Batch: M108496

M-h

08/09/16 (1X)

31.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

08/09/18 @

32.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

*****ENSURE INSERTS ARE AT LOCATION (6) AS PER DWG D2966*****

08/09/18 @

33.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick: Packing Kit

34.0

D2972

Bushing



Comment: Qty.: 6.0000 Each(s)/Unit Total: 6.0000 Each(s)

Pick: Packing Kit

Qty Part Number Description Batch

6 D2972 Bushing

14103

SS 08/09/18 @

35.0

D2974

Packer



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Pick: Packing Kit

Qty Part Number Description Batch

1 D2974 Packer

34249

SS 08/09/18 @

36.0

D2975

Wearshoe



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Pick: Packing Kit

Qty Part Number Description Batch

2 D2975 Wearplate

34234

SS 08/09/18 @

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Drawing Name: BO 105 SKIDTUBE ASSEMBLY

Job Number: 41331

Part Number: D105674011

Job Number:



Seq. #:

Machine Or Operation:

Description :

37.0

AN451A

Bolt



Comment: Qty.: 3.0000 Each(s)/Unit Total : 3.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

3 AN4-51A Bolt

M108376

JS 08/09/18 (K)

38.0

AN960JD10L

Washer



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

8 AN960JD10L Washer

M108376

M105793

JS 08/09/18 (K)

39.0

MS21042L4

Nut



Comment: Qty.: 3.0000 Each(s)/Unit Total : 3.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

3 MS21042L4

Nut

M107499

JS 08/09/18 (K)

40.0

MS27039108

Screw



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Pick: Packing Kit

Qty Part Number

Description Batch

8 MS27039-1-08 Screw

M109001

JS 08/09/18 (K)

41.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

08-09-19 (1)

42.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D105-674-0111

Location:

11a (K)
JS 08/09

41331

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

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Job Number: 41331

Part Number: D105674011

Job Number:



Seq. #:

Machine Or Operation:

Description :

43.0

QC21

FINAL INSPECTION/W/O RELEASE



08/09/23
JL

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



mf 08-09-22

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN RF	DRAWN BY RF	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED #	APPROVED #	DRAWING NO. D2966	REV. A SHEET 1 OF 2
DATE 00.03.08		TITLE BO 105 SKIDTUBE ASSEMBLY SCALE NTS	
A	00.03.08	NEW ISSUE	

RELEASED
00.05.11 #

Qty	Part Number	Description
X	D2966-041	SKIDTUBE ASSEMBLY
1	D2962-125	EXTRUSION
1	D2964	CAP
1	D2965	CAP
1	D2970-1	WEARPLATE
1	D2970-3	WEARPLATE
1	D2971	CROSS BOLT SPACER
7	D2973	CROSS BOLT SPACER
1	D2976	WEB
36	ALS7-1032-130 or ALS4-1032-130 or AKS7-1032-130 or AKS4-1032-130	INSERT
28	AN960JD10L	WASHER
26	MS27039-1-08	SCREW
2	MS27039-1-09	SCREW
1	D3176-1	BUSHING
1	D3176-3	NUT



GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) WELDING TO BE DONE PER DART QSI 004.
- 3) INSERT D2976 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241/-291 ADHESIVE PER DART QSI 015 AFTER BENDING.
- 4) USE DART DRILL TEMPLATE DT8451 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION B-B (34 PLACES) AFTER FINISH. SEAL WEARPLATE SCREWS WITH SIKAFLEX-241/-291.
- 5) DO NOT INSTALL MS27039-1-08 SCREWS AND AN960JD10L WASHERS IN THESE LOCATIONS.
- 6) INSTALL ALS7-1032-130 INSERT, MS27039-1-08 SCREW, AND AN960JD10L WASHER IN 2 PLACES THIS LOCATION BEFORE POWDER COATING.
- 7) FINISH:

ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2976 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF 4.3.5.4) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED TO 1.00 ABOVE CENTER LINE PER DART
QSI 005 4.4 (OPTIONAL) BLACK SANDTEX (REF 4.3.5.7)



01.01.24
CP 01.01.30

A2	02.10.30	ADD D3176-1/-3	# CP
A1	01.01.24	CHANGE COLOR TO BLACK SANDTEX	# CP

SHOP COPY
RETURN TO
ENGINEERING

UNCONTROLLED COPY

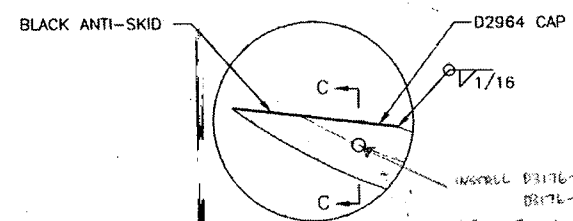
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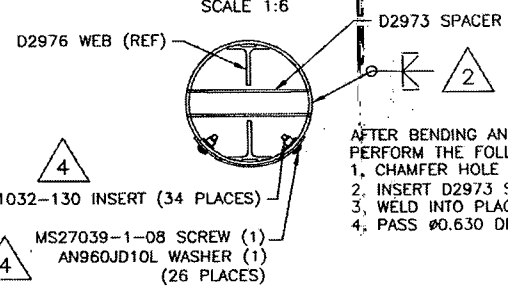
WORK ORDER
NO. 41331

RELEASED
60-05, 11

DETAIL A
SCALE 1:3

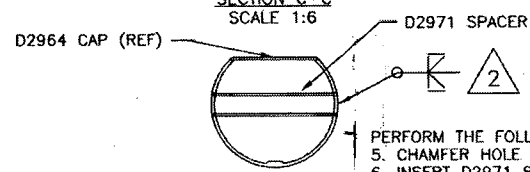


SECTION B-B
SCALE 1:6



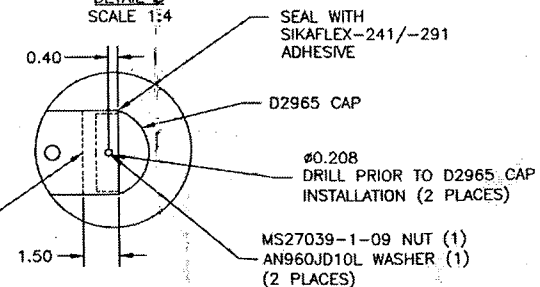
- AFTER BENDING AND DRILLING ASSEMBLY
PERFORM THE FOLLOWING FOR $\phi 0.750$ HOLES ONLY:
1. CHAMFER HOLE $0.030 \times 45^\circ$
 2. INSERT D2973 SPACER (7 PLACES)
 3. WELD INTO PLACE AND GRIND FLUSH
 4. PASS $\phi 0.630$ DRILL TO REMOVE SPILL OVER

SECTION C-C
SCALE 1:6

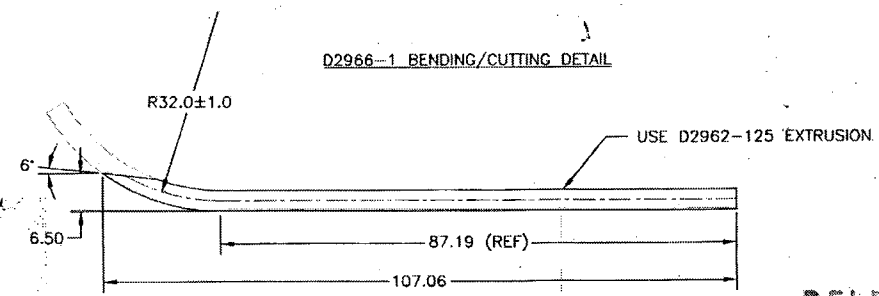


- PERFORM THE FOLLOWING FOR $\phi 0.625$ HOLES ONLY:
5. CHAMFER HOLE $0.030 \times 45^\circ$
 6. INSERT D2971 SPACER
 7. WELD INTO PLACE AND GRIND FLUSH
 8. PASS $\phi 0.484$ DRILL TO REMOVE SPILL OVER

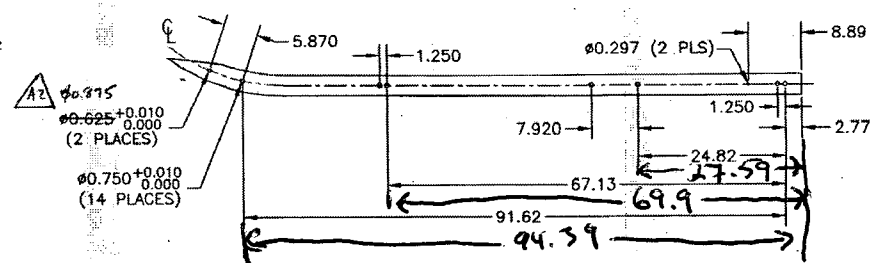
DETAIL D
SCALE 1:4



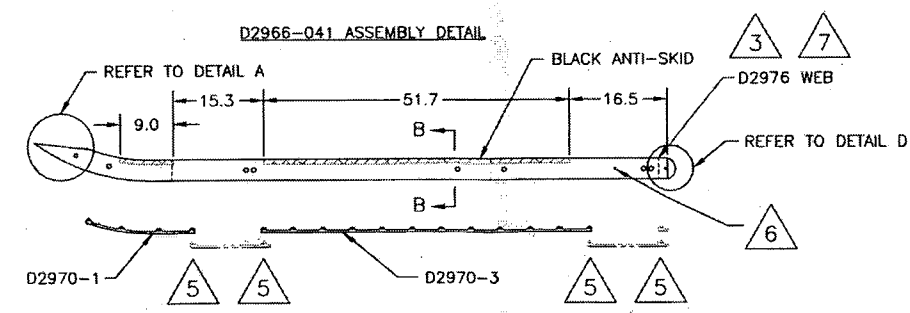
D2966-1 BENDING/CUTTING DETAIL



D2966-1 DRILLING DETAIL



D2966-041 ASSEMBLY DETAIL



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		DATE 00.03.08	TITLE BO 105 SKIDTUBE ASSEMBLY		SCALE 1:20

NO 41331
WORK ORDER
WITHOUT NOTICE
SUBJECT TO AMENDMENT
UNCONTROLLED COPY
ENGINEERING
RETURN TO
SHOP COPY
NO 41331

NO. 172

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliot
Job number: 41331
Part number: D105 674 011
Description: B0105 skid tube
Welding Process: Tig[☒] Mig[]
Base material: Aluminium
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier Pat Dwyer Date of Test Coupon 08-09-05

Welder Barclay Elliot Date of Test Coupon 08-09-05

The above named individual is qualified in accordance with AWS D17.1.2001 to weld